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# Science Flight Report

## Operation IceBridge Arctic 2012



**Flight:** F13  
**Mission:** Cryoland

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### Flight Report Summary

<b>Aircraft</b>	<b>P-3B (N426NA)</b>
<b>Flight Number</b>	14
<b>Flight Request</b>	12P006
<b>Date</b>	Friday, March 30, 2012 (Z)
<b>Purpose of Flight</b>	Operation IceBridge Mission Cryoland
<b>Take off time</b>	11:00 Zulu from Thule Air Base (BGTL)
<b>Landing time</b>	17:49 Zulu at Thule Air Base (BGTL)
<b>Flight Hours</b>	7.0 hours
<b>Aircraft Status</b>	Airworthy.
<b>Sensor Status</b>	All installed sensors operational.
<b>Significant Issues</b>	None
<b>Accomplishments</b>	<ul style="list-style-type: none"><li>• Low-altitude survey (1,500 ft AGL) over the Greenland Ice Sheet along previously surveyed ICESat and CryoSat-2 ground tracks.</li><li>• Completed entire mission as planned.</li><li>• ATM, snow, Ku-band, accumulation and MCoRDS radar, gravimeter, magnetometer, DMS and KT-19 skin temperature sensor were operated on the survey lines.</li><li>• Two ramp pass at Thule. One at 1,500 and one at 1,000 ft AGL, respectively.</li></ul>
<b>Geographic Keywords</b>	Greenland Ice Sheet, Camp Century, GRIP, NGRIP, NEEM
<b>Satellite Tracks</b>	CryoSat-2 orbit 10482, ICESat orbit 0205
<b>Repeat Mission</b>	2011

## Science Data Report Summary

Instrument	Instrument Operational			Data Volume	Instrument Issues
	Survey Area	Entire Flight	High-alt. Transit		
ATM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	31 GB	None
MCoRDS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1.5 TB	None
Snow Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	570 GB	None
Ku-band Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	570 GB	None
Accumulation Radar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	165 GB	None
DMS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	122 GB	None
KT-19 Skin Temp.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	9 MB	None
Gravimeter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1.5 GB	None
Magnetometer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	280 MB	None

### Mission Report (Michael Studinger, Mission Scientist)

Today, we have flown the first ice sheet mission on this deployment. We have only two sea ice mission plans left and the remaining low priority Northwest Passage sea ice mission was poor today. The second remaining sea ice mission plan with medium priority is the Fram Strait, which had marginal conditions today, but we have to save the Fram Strait mission plan for Monday, April 2<sup>nd</sup>, 2012 for our second and last chance to do a CryoSat-2 underflight with all 3 aircraft. So we decided to fly the first ice sheet mission today. We selected the Cryoland mission plan for four reasons: 1) it is high priority; 2) it covers a very large survey area that needs to be cloud free which is very rare; 3) today's CryoSat-2 orbit is approximately orthogonal to the contour lines of the ice sheet, making cross-track placement of the CryoSat-2 footprint more likely to fall at an easily predictable place – nadir; 4) today's orbit is only 1.3 km away from the orbit that we have flown last year on March 29, 2012, which will make an ideal data set for annual comparison. We had several very rare conditions in place today and therefore chose the Cryoland mission plan.

In addition to the ICESat and CryoSat-2 ground tracks we also collected data along the northern portion of a CreSIS-requested line connecting the GRIP, NGRIP, NEEM and Camp Century drill sites.

The weather was good as expected, with some pockets of clouds and fog here and there that did not pose any problems.

### Individual instrument reports from experimenters on board the aircraft:

**ATM:** The ATM T3 spare laser was off today because its pulse repetition frequency interferes with the MCoRDS radar. ATM lost only 3 minutes of data because we had to climb over a cloud. ATM collected a total of 6.7 hours of science data.

**MCoRDS:** The MCoRDS system worked well.

**Snow and Ku-band radar:** The snow and Ku-band radars worked well. A few minutes of data was lost for a disk change.

**Accumulation radar:** Worked well.

**Gravimeter:** Worked well.

**Magnetometer:** Worked well.

**DMS:** DMS worked well and collected data on the primary system only today.

**KT-19 skin temperature sensor:** System worked well.

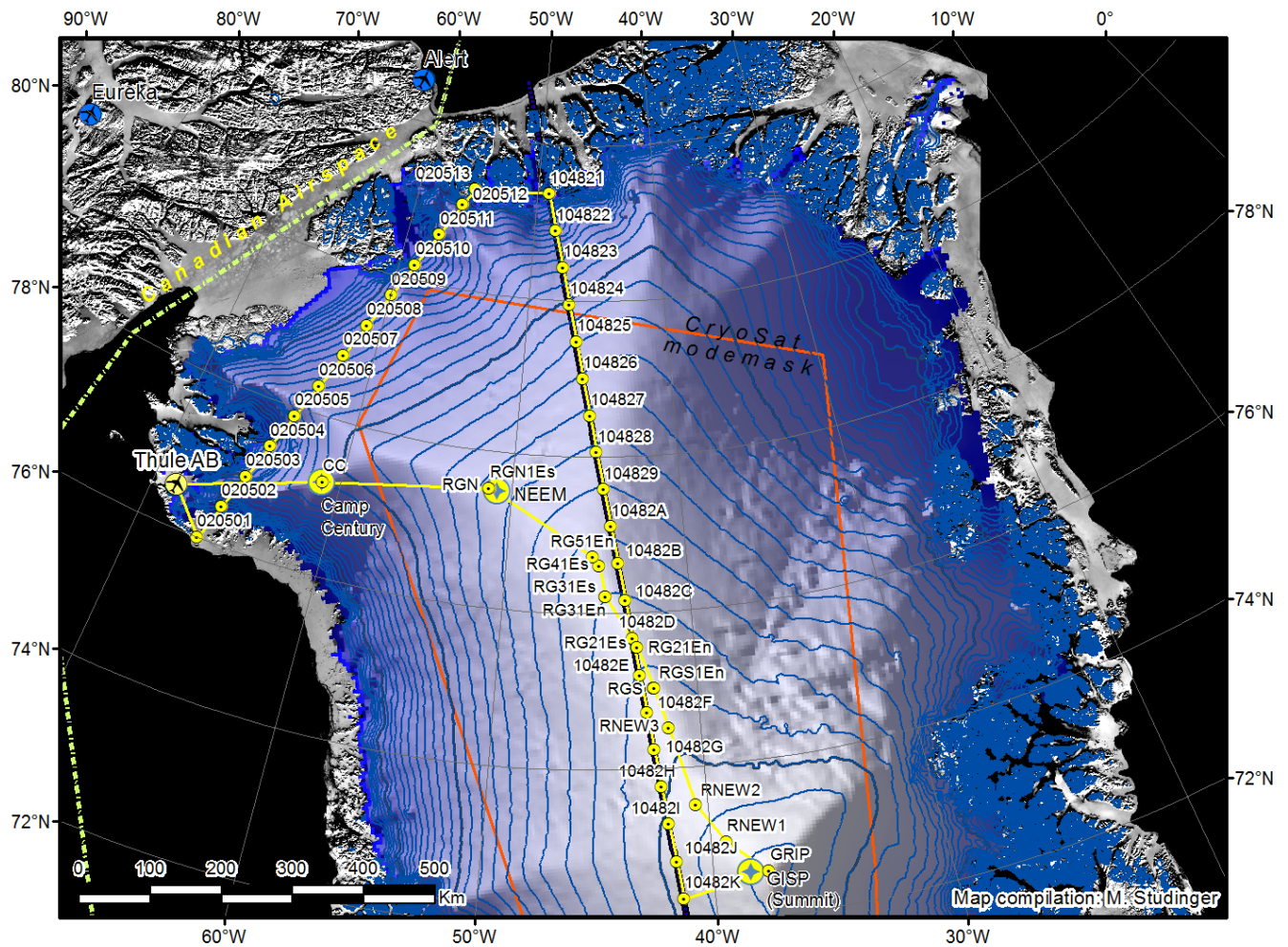


Figure 1: Today's mission plan (yellow). Red boxes outline the CryoSat-2 mode mask.